BioTrade2020plus

Supporting a Sustainable European Bioenergy Trade Strategy

Intelligent Energy Europe
IEE/13/577/SI2.675534

Deliverable 4.2

Requirements of end users for the interactive BIOTRADE2020+ tool

Publicity level: PU
Date: 13/11/2014

Co-funded by the Intelligent Energy Europe Programme of the European Union

The BioTrade2020plus Project

Objectives

The main aim of BioTrade2020plus is to provide guidelines for the development of a **European Bioenergy Trade Strategy for 2020 and beyond** ensuring that imported biomass feedstock is sustainably sourced and used in an efficient way, while avoiding distortion of other (non-energy) markets. This will be accomplished by analyzing the potentials (technical, economical and sustainable) and assessing key sustainability risks of current and future lignocellulosic biomass and bioenergy carriers. Focus will be placed on wood chips, pellets, torrefied biomass and pyrolysis oil from current and potential future major sourcing regions of the world (Canada, US, Russia, Ukraine, Latin America, Asia and Sub-Saharan Africa).

BioTrade2020plus will thus provide support to the use of stable, sustainable, competitively priced and resource-efficient flows of imported biomass feedstock to the EU – a necessary pre-requisite for the development of the bio-based economy in Europe.

In order to achieve this objective close cooperation will be ensured with current international initiatives such as IEA Bioenergy Task 40 on "Sustainable International Bioenergy Trade - Securing Supply and Demand" and European projects such as Biomass Policies, S2BIOM, Biomass Trade Centers, DIA-CORE, and PELLCERT.

Activities

The following main activities are implemented in the framework of the BioTrade2020plus project:

- Assessment of **sustainable potentials of lignocellulosic biomass** in the main sourcing regions outside the EU
- Definition and application of sustainability criteria and indicators
- Analysis of the **main economic and market issues of biomass/bioenergy imports** to the EU from the target regions
- Development of a dedicated and **user friendly web-based GIS-tool** on lignocellulosic biomass resources from target regions
- **Information to European industries** to identify, quantify and mobilize sustainable lignocellulosic biomass resources from export regions
- **Policy advice on long-term strategies** to include sustainable biomass imports in European bioenergy markets
- **Involvement of stakeholders** through consultations and dedicated workshops

More information is available at the BioTrade2020plus website: **www.biotrade2020plus.eu**

About this document

This report corresponds to D4.2 – **Requirements of end users for the interactive BIOTRADE2020+ tool.** It has been prepared by: DLO-Alterra

Start date of project:	01-03-2014
Duration:	30 months
Due date of deliverable:	Month 8
Actual submission date:	Month 8 – October 2014

Work package	WP4
Task	Task 4.1
Lead contractor for this deliverable	DLO
Authors	Joske Houtkamp, Berien Elbersen, Natasa Sikirica & Gert-Jan Nabuurs
Collaborations	

Dissemination Level		
PU	Public	PU
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services):	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Version	**Date**	**Reason for modification**	**Status**
0.1	30/09/2014	Non	Pre-final
1	11/11/2014	Minor changes in response to CENER comments	Final

This project is co-funded by the European Union within the INTELLIGENT ENERGY - EUROPA Programme. Grant Agreement n ˚IEE/13/577/SI2 .675534. The sole responsibility of this publication lies with the author. The European Union is not responsible for any use that may be made of the information contained therein.

Co-funded by the Intelligent Energy Europe
Programme of the European Union

Table of Contents

1 Introduction

One of the objectives of the BioTrade2020plus Project is to develop a user friendly, GIS-based interactive tool, to assist European industry in the identification of sustainable origins for the import of solid biomass. It will present transparent information so users can identify, quantify and mobilize sustainable and resource efficient lignocellulosic biomass resources from the main export regions to the EU to complete their biomass supply needs.

The compilation and analysis of this information in a user-friendly tool is expected to support a well-established development of the bioenergy sector and the wider bioeconomy in EU countries.

The overall main aim of **BioTrade2020plus** is to provide guidelines for the development of a **European Bioenergy Trade Strategy for 2020 and beyond** ensuring that imported biomass feedstock is sustainably sourced and used in an efficient way, while avoiding distortion of other (non-energy) markets. This will be accomplished by analyzing the potentials (technical, economical and sustainable) and assessing key sustainability risks of current and future lignocellulosic biomass and bioenergy carriers. Focus will be placed on wood chips, pellets, torrefied biomass and pyrolysis oil from current and potential future major sourcing regions of the world (Canada, US, Russia, Ukraine, Latin America, Asia and Sub-Saharan Africa).

One important result of the BioTrade2020plus project will be an **interactive internet tool** that will inform biomass end- users about the biomass cost-supply in key current and potential future sourcing regions outside the EU. For these different biomass potentials related characteristics are provided on sustainability performance and risks, the regulatory context, coverage by certification schemes and quality aspects of relevance to determine suitability for specific end-uses. A map based access will be provided in the tool enabling the user to directly focus on the region and biomass type of interest The geographic resolution and coverage at which the different types of information layers are presented in the tool will be flexible and adapted to the type, quality and completeness of the information it offers.

In order to develop a tool that is useful for a wide public there is a need to collect opinion and advice from a wide range of end users about their information needs. Since a wide range of potential end-users were gathered at the 22nd European Biomass Conference in Hamburg this event was chosen as a place where interviews could be performed to gather information on the end-user requirements for the tool to be developed in the project.

This document describes the user requirements analysis for the tool conducted in 2014 by Alterra WUR. In this document we summarize the main findings of interviews held with 50 participants of the 22nd European Biomass Conference and Exhibition in June 2014, in Hamburg.

2 User identification and information needs analysis

For the development of the BioTrade2020plus tool we aim to first, identify the information needs of professionals involved in the domain of biomass production, processing, and trade; and secondly, decide which of these needs may be met by the tool during and possibly after the project life time. These activities ensure that the tool offers the project outcomes which are most needed by stakeholders, and that the stakeholders can easily access and use these outcomes.

During the Biomass Conference in Hamburg (June 2014), we conducted 50 semi-structured interviews with stakeholders to determine their information needs and their expectations of a tool for their business or research activities. Some stakeholders were personally invited for the interview because of their expertise, but most were randomly selected at the conference exhibition.
The interview questions are included as Appendix 1.

To answer the question on information needs, we made a focused selection of the interview results. It comprises the main information needs of the interviewees, and identifies the main requirements of the intended user group of the BioTrade2020plus tool.

Some notes on the results:
In a few cases, interviewees did not provide an answer, or provided more answers than requested. Therefore the number of answers does not always add up to 50 (which was the number of interviews conducted). Sometimes, e.g. because of this, the results show slight ambiguities. In those cases, the results are presented in rounded percentages.

3 Who were the interviewees?

The interviewees were participants of the conference or the exhibition. 80% were representatives of European companies or organisations; the other 20% originated from Asia, Central and South America, Africa, and Australia. Of the Europeans, Germany and Italy were represented best, namely by 9 and 6 participants, respectively.

More than half of the interviewees (27) worked at a company or research institute involved in research and/or consultancy, with a focus on a broad range of topics. These vary from for instance laboratory analysis of quality and properties of biomass; energy related catalysis and biomass; industrial biotechnology; biomass gasification; biomass conversion technologies; bioeconomy; sustainability; feasibility studies and policy recommendations. A relatively large number (15) selected the category 'other'. This category included for instance biogas project realisation, and biomass processing. 12 worked for biomass production companies, 7 answered that their companies were involved in biomass end-use. 6 interviewees were employed by policy making companies. Other categories of companies were only represented by a small number of interviewees, showing the large variety in companies attending the conference (Fig.1.)

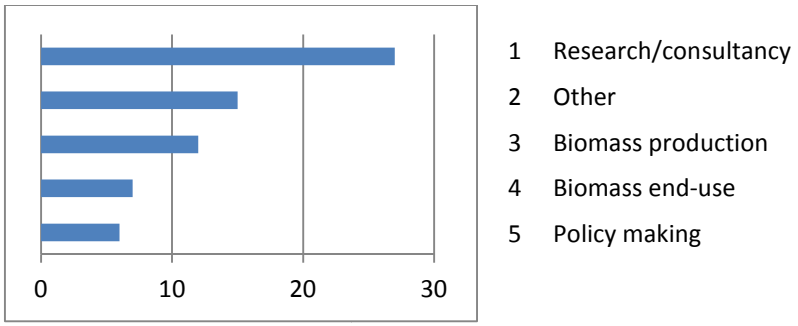
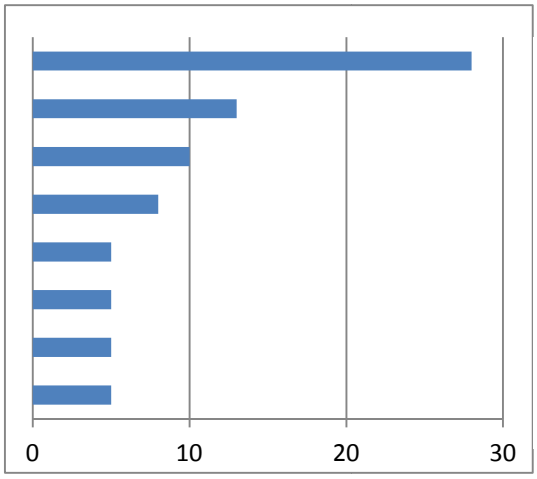


Fig. 1. The type of company/organisation at which the interviewees were employed

To describe the core business of their companies, the interviewees could select an answer from a more detailed list of 20 topics, and indicate several of them as important. Again most respondents (28) selected research and consultancy, 13 interviewees the category 'other'. 10 selected "Biomass conversion into energy (electricity & heat)"; 8 "Policy development and implementation". The other answers were selected 5 times or fewer (Fig.2).

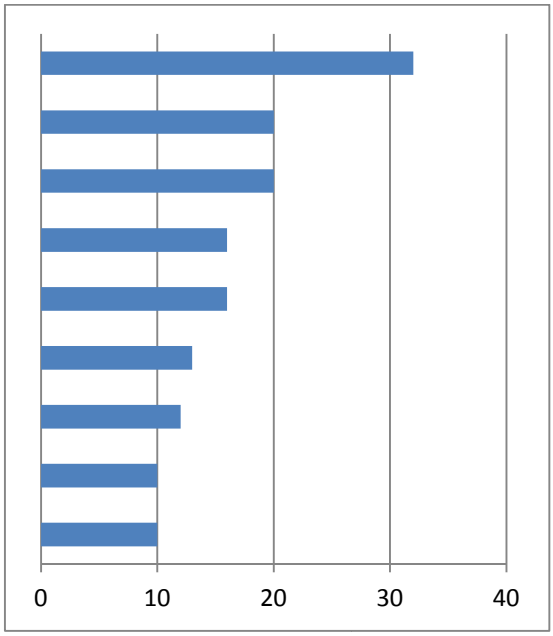


1 Research/consultancy
2 Other (e.g. biogas technology, bio polymers, lab analysis of biomass)
3 Biomass conversion into energy (electricity & heat)
4 Policy development and implementation
5 Primary biomass production (cropping of biomass)
5 Biomass conversion into energy (biofuels 1G)
5 Biomass conversion into energy (biofuels 2G)
5 Development of machinery for biomass conversion/pre-treatment

Fig. 2. The core business of the company/organisation at which the interviewees are employed.

Tables 1 and 2 in Appendix 2 show the full results.

Respondents were asked which biomass types were relevant for their work. Many selected a number of options. Most selected biomass types were: “Agricultural residues (e.g. straw, cuttings, oil palm residues)” (selected 32 times); “Woody and perennial biomass from dedicated crops” (20);” Forest biomass (round wood, pulpwood, chips and pellets from primary residues) (20)”; “Secondary residues from the forest industry” (16) and “Municipal Solid Waste” (16) (Fig.3). The complete results are presented in Table 3 (Appendix 2).



1 Agricultural residues (e.g. straw, cuttings, oil palm residues)
2 Woody and perennial biomass from dedicated crops
2 Forest biomass (round wood, pulpwood, chips and pellets from primary residues)
4 Secondary residues from the forest industry
4 Municipal Solid Waste
6 Wood waste
7 Animal waste from industries
8 Vegetal waste from households and industries
9 Common sludge

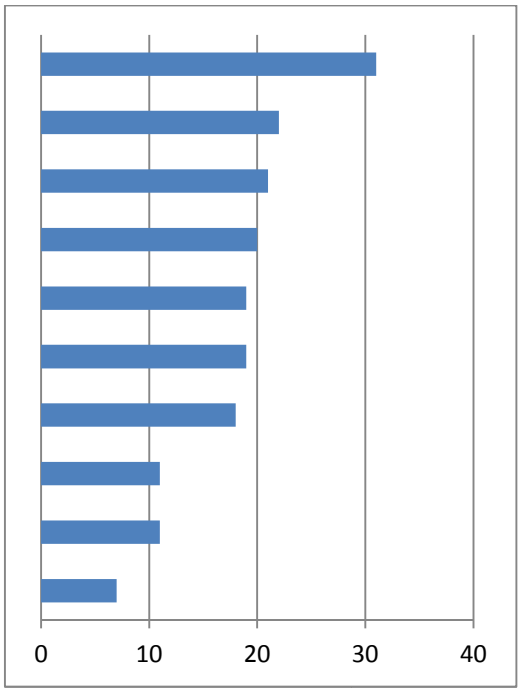
Fig. 3. Biomass types of interest for the interviewees.

4 The information needs of the respondents: results per question

4.1 Question: On which topics related to biomass do you need information for your work, and which are the most important?

Of the 50 interviewees, 48 answered this question and selected one of the 10 options provided as the most important for their work. Most of them (17, 35%) answered "Biomass resource availability", and 10 (21%) "Biomass conversion technologies for electricity, heat, cooling". 6 (12%) answered that for them information on "Biomass conversion technologies for intermediates, liquid, solids, gaseous fuels" was the most important. The other outcomes for the most important topics can be seen in Table 4 (Appendix 2).

Interviewees were asked *which three* they found most important. When their numbers 1, 2 and 3 are taken together, it shows that the general need for information is high and concerns two major topics: in the first place biomass resources availability, and related topics such as markets, policies, and sustainability. The second major topic concerns different types of conversion technologies. 31 participants, i.e. 62%, mentioned "Biomass resources availability" (Fig.4).
The complete overview is shown in Table 5 (Appendix 2).

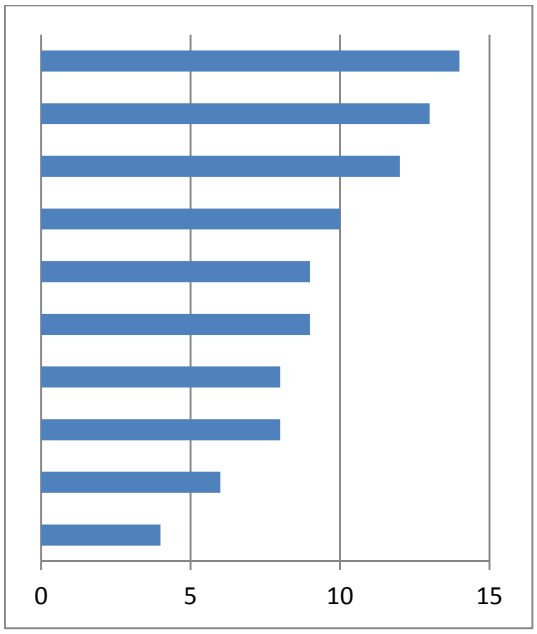


1 Biomass resources availability
2 Biomass conversion technologies for electricity, heat, cooling
3 Biomass policies
4 Biomass sustainability
5 Biomass markets
5 Biomass conversion technologies for intermediates, liquid, solids, gaseous fuels
7 Biomass conversion technologies for biochemical and biomaterials
8 Biomass certification
8 LCAs for biomass delivery chains
10 Other

Fig. 4. Topics the interviewees require information on.

We further investigated the information needs of the interviewees who are connected to industry, and who indicated that their company belongs mainly in the categories "Biomass end-use", "Biomass production", and "Other", discussed in chapter 2. They represent the main user group of the BioTrade2020plus tool. When asked about their top 3, they also indicated that "Biomass resources availability" is their major interest (15% of the answers); however their second choice concerned "Biomass policies"

(14% of the answers); their third choice “Biomass markets” (11% of the answers). Biomass conversion technologies also got a high score (Fig.5).



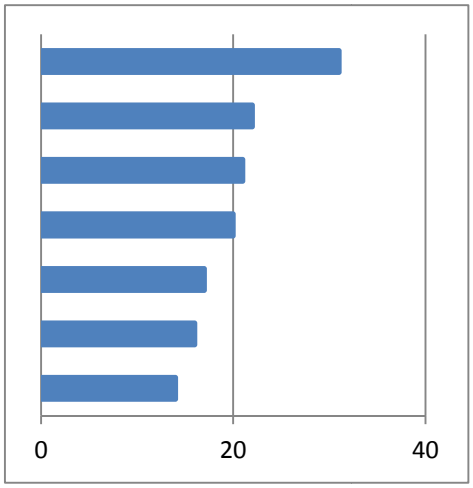
1 Biomass resources availability
2 Biomass policies
3 Biomass markets
4 Biomass conversion technologies for electricity, heat, cooling
5 Biomass sustainability
5 Biomass conversion technologies for biochemical and biomaterials
7 Biomass conversion technologies for intermediates, liquid, solids, gaseous fuels
7 Biomass certification
9 LCAs for biomass delivery chains
10 Other

Fig. 5. Topics the expected users from industry (companies belonging to “Biomass end-use”, “Biomass production”, and “Other”) of the BioTrade2020plus tool require information on.

4.2 Question: Please indicate which information to be provided by a tool would be useful to you, and please point out the top 3 by importance to you.

The interviewees were asked to indicate which information from 8 categories offered a tool should provide, and again rank the most important three. Two answers were selected by more than half of the participants: “Detailed spatially explicit cost-supply on biomass sources” was given as the most important type of information by 16 of 49 interviewees who answered this question, i.e. 33%. 10 interviewees (20%) indicated they mostly required information on “Current and future international trade patterns and market segments of biomass resources and competing uses for non-energy applications and for local uses”. Table 6 shows the other results for this question.

Again, interviewees were asked which three they found most important. “Detailed spatially explicit cost-supply on biomass sources” was mentioned most often, 31 times. Also “Support for matching cost-supply of biomass to price-demand patterns”(22), “Current and future international trade patterns and market segments of biomass resources and competing uses for non-energy applications and for local uses” (21), and “Key characteristics of the traded biomass particularly in relation to suitability for different conversion/pre-treatment pathways”(20) were considered important information categories to be included in a tool. The answers reveal clearly that in general the information need of the interviewees is high; the other options were also selected often (Fig.6). Table 7 shows the results for this question (Appendix 2).



1 Detailed spatially explicit cost-supply on biomass sources

2 Support for matching cost-supply of biomass to price-demand patterns

3 Current and future international trade patterns and market segments of biomass resources (…)

4 Key characteristics of the traded biomass particularly in relation to suitability for different conversion/pre-treatment pathways

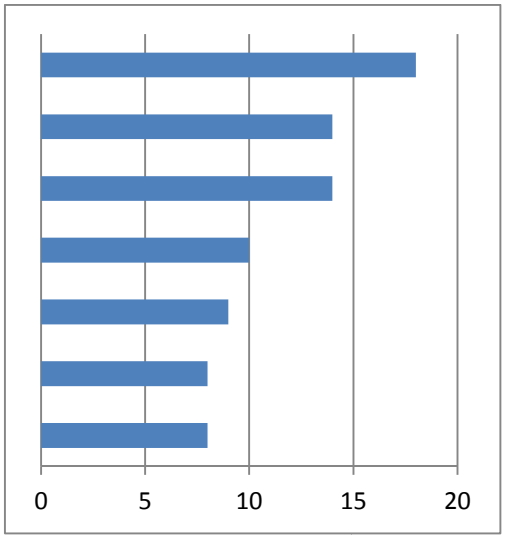
5 Details of the sustainability schemes in place (….)

6 Overview of the regulatory framework implemented in and outside the EU affecting biomass imports into the EU

7 Sustainability risks per biomass type

Fig. 6. Ranking of most useful information in a tool as selected by all interviewees.

The selection of interviewees who represent the main user group of the BioTrade2020plus tool, also mentioned "Detailed spatially explicit cost-supply on biomass sources" most often (20% of the answers). The next most important information categories were "Support for matching cost-supply of biomass to price-demand patterns" and "Key characteristics of the traded biomass particularly in relation to suitability for different conversion/pre-treatment pathways" (each 16%) (Fig.7).



1 Detailed spatially explicit cost-supply on biomass sources

2 Support for matching cost-supply of biomass to price-demand patterns

2 Key characteristics of the traded biomass particularly in relation to suitability for different conversion/pre-treatment pathways

4 Overview of the regulatory framework implemented in and outside the EU affecting biomass imports into the EU

5 Details of the sustainability schemes in place (….)

6 Current and future international trade patterns and market segments of biomass resources (…)

6 Sustainability risks per biomass type

Fig. 7. Ranking of useful information in a tool, according to the expected main user group of the BioTrade2020plus tool.

4.3 Question: What (type of) information that is relevant to you is not available or is difficult to find?

50 % of the interviewees said they use specific internet tools or sites to find the information they need; 50% said they do not. Many acquire their information from personal contacts, networks and events, for instance at conferences and exhibitions.

The respondents were asked what (type of) information was difficult to find or even unavailable at the moment. The answers repeated partly the topics mentioned earlier, and are obviously specific and related to their organisations' objectives, but often mentioned were:

- information about new initiatives and new projects still in early planning phases;
- up to date information on biomass availability, costs, trade, demand;
- other features of available biomass concerning for instance composition, quality and sustainability.

Interviewees valued especially accessibility of this information at one location or in one tool.
The complete list of answers is found in Appendix 2.

4.4 Question: What should an internet tool deliver, to be useful to you?

The answers of the participants are sometimes contradicting, but a number of times the following requirements were mentioned:

- reliable, accurate, up-to-date;
- transparent and documented, including source data and data sources;
- showing future trends;
- global coverage, but also with enough detail to be useful;
- supporting a network of companies and organisations;
- allowing users to contribute;
- tailored to users' needs (for instance differentiate between researchers and investors).

4.5 Question: Which geographic areas are you mostly interested in (in relation to information provided by a tool)?

The interviewees could answer in their own words, so the answers show some overlap in regions and areas. They mentioned an interest in European countries 37 times; however, only twice specifically non-EU European countries. A similar interest (38) was for regions outside Europe: 11 interviewees were interested in Asian countries, 8 in Africa, 8 in South America, 6 in North America, and 1 in the Pacific region. 4 respondents had a global interest.
The high interest of the interviewees in Europe is probably related to the origin of the interviewees, 80 % of whom were European. The interest in the geographical regions is divided over all interviewee categories.

4.6 Question: How often do you require this type of information?

23 interviewees reported that they would need the information from a tool monthly; 14 yearly; 11 weekly; only 4 daily. Most interviewees apparently do not expect a tool to provide very dynamic or volatile information (or seemed to think this would not be feasible).

4.7 Question: What is the time-frame this information should be provided for?

More than half of the respondents (28) needed information on the current situation. However, 27 also require expectations or trends for the future, for a period up to 10 years; and 11 even a longer term perspective. Only 3 mention trends from the past. This supports their information need for developing a business strategy.

5 The use of online tools

We asked the respondents whether they used websites or specific tools on the Internet for information on biomass: half of them did not. Most were not familiar with the BIORAISE tool and the Bioenergy Decision Support tool, that we provided as examples during the interviews; however, after the content and functionality of the tools were explained to them almost all were very interested and considered the tools useful. The BIORAISE tool will be used as an example during the design and development of the BioTrade2020plus tool, so the positive reactions of the respondents to the BIORAISE tool are supportive of the current design ideas in the project.
The BIORAISE tool provides a calculation of biomass resource availability (agricultural and forestry primary, secondary and tertiary resources) for Spain, Portugal, France, Italy and Greece (Fig.8). http://bioraise.ciemat.es/bioraise/intro.aspx

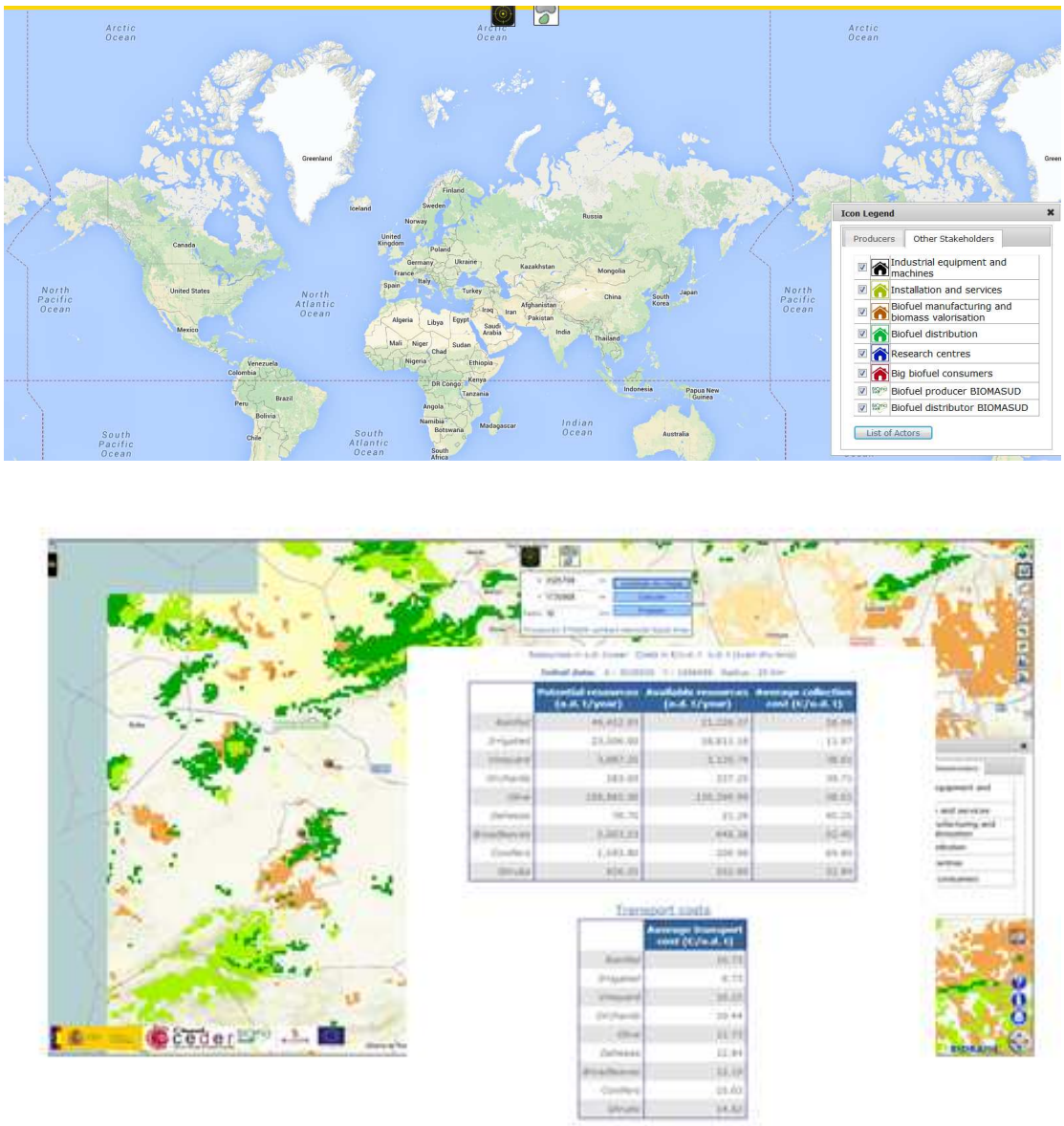


Fig. 8 Some screen-shots of the BIORAISE tool.

6 Conclusions

The information needs of the interviewees showed a large variation, which corresponds with the variation in their professions and organisations. However, the general need for information is high and concerns two major topics: on the one hand biomass resources availability (mentioned by 62% of the interviewees), and related topics such as markets, policies, and sustainability. The second major topic concerns different types of conversion technologies. In contrast to fossil fuel markets where prices and quantities are available every second, the biomass market is a new undeveloped market where there is a large need for information.

Regarding the information a tool might offer, 62% selected from the offered “Detailed spatially explicit cost-supply on biomass sources” as most important for their work. Also other trade related aspects such as price-demand patterns and international trade patterns were mentioned often.
The interest in cost-supply information is expressed most often by interviewees involved in biomass conversion, collection and other related industry; much less by those involved in policy making, research and consultancy. This confirms that the intended user group within the biomass community will be interested in the information of the BioTrade2020plus tool. The interest in biomass from agricultural residues is high, which also supports the intentions of the project to focus within the ligno-cellulosic biomass availability on both agricultural residues and forest biomass.

The geographical focus of the interviewees was on Europe; however, half of the respondents also need information about other parts of the world. A tool for information on cost-supply on non-food biomass sources within Europe will be developed within the S2Biom project (http://www.s2biom.eu); the BioTrade2020plus tool will provide information for users who require information about sources in other continents. The interest in regions outside Europe was spread over the different categories (so policy makers, research/consultancy and industry).

The information of a tool is expected to reflect the current situation, but many interviewees (from all categories) stressed the importance of future trends and expectations as well. Most expressed their interest in information up to 10 years from now, and some also beyond that. This future perspective is evidently an important requirement for the tool. Sometimes it seems respondents are looking for market ‘predictions’ which will clearly not be possible from any tool. At best, availability at certain prices and under certain regulations can be estimated.

Many respondents were unfamiliar with the examples of interactive tools that were presented to them, but almost all were interested in their functionality and the information they could provide. When asked about their expectations of a tool, they underlined a.o. the importance of quality and reliability of the data and data sources, and expressed their desire to contribute to the tool and use it as a platform for networking. Clearly, any tool needs to be advertised, and users trained to some extent. It is remarkable that al interviewees are looking for information, but 50% of them are not aware that some online tools are available.

The unfamiliarity with internet tools of most potential end-users also implies that the user should be suitable to be used by non-specialist users of tools and that it should be easy to use, self-explanatory and quick. At the same time it should provide clear direct access to back-ground data and documents to underpin the quality of the data and

provide transparent information on the source data and assessment approaches of the results presented in the tool.

The interviewees emphasized very strongly that the tool can only be useful to them if the information provided through the tool is transparent and well documented, so link to source data and data sources must be made very explicit. Data must be reliable, accurate and up-to-date.

In this light it is also clear that an important challenge for the BioTrade2020plus tool, as for all online interactive tools, is the maintenance of the data after the time span of the project.

Finally, attention must be paid to organizing the publicity and communication for the tool, because the intended users are currently not accustomed to using online tools for data acquisition in their domain. However, it was striking that a short demonstration of the BIORAISE tool to the interviewees made them very enthusiastic about the functionality of such tool for providing the information on biomass cost-supply for regions and areas which they could specify to focus on during use of the tool.

7 BioTrade2020plus Consortium

CENER – National Renewable Energy Centre, Biomass Department, Spain

Project Coordinator BioTrade2020plus

Contact persons: David Sánchez González & Inés del Campo Colmenar

Imperial – Imperial College London, Centre for Environmental Policy, United Kingdom

Contact persons: Dr Rocio Diaz-Chavez

DLO – Alterra, Wageningen University and Research, The Netherlands

Contact persons: Dr Gert-Jan Nabuurs & Dr Berien Elbersen & Dr Wolter Elbersen

IINAS – International Institute for Sustainability Analysis and Strategy GmbH, Germany

Contact person: Leire Iriarte & Uwe Fritsche

***VITO - Flemish Institute for Technological Research,* Belgium**

Contact persons: Luc Pelkmans

UU - Utrecht University, Faculty of Geosciences, Energy & Resources, Copernicus Institute of Sustainable Development, The Netherlands

Contact persons: Dr Martin Junginger & Thuy Mai-Moulin

WIP- WIP Renewable Energies, Germany

Contact persons: Dr Rainer Janssen & Dominik Rutz

8 Appendices

Appendix 1 Interview questions

Interviews participants Biomass Conference Hamburg
23-26/06 2014

Would you be willing to help us develop an interactive tool on biomass and its sustainability, by answering some questions we prepared? It would take about 15 minutes. *The aim of this interview is to identify requirements of end-users for a tool to be developed as part of the* **BioTrade2020plus** *project, an Intelligent Energy Europe Project financed by DG-TRANSPORT.*

The main aim of **BioTrade2020plus** *is to provide guidelines for the development of a* **European Bioenergy Trade Strategy for 2020 and beyond** *ensuring that imported biomass feedstock is sustainably sourced and used in an efficient way, while avoiding distortion of other (non-energy) markets.*

The **interactive internet tool** *that will be developed is meant to inform biomass end-users about the biomass cost-supply in key, current and potential future, sourcing regions outside the EU. For these different biomass potentials related characteristics are provided on sustainability performance and risks, the regulatory context, coverage by certification schemes and quality aspects of relevance to determine suitability for specific end-uses.*

The interview results will be anonymized in our analysis and report. However, we would like to start with asking some questions about your company (organization) and your position and interests.

1. Name

2. Organisation/Company

3. Country

4. What is the core business of your organization/company?
(*more than one option allowed; put **X** where relevant, and add text where needed*)

a	Primary biomass production and harvesting (forest industry)	
b	Primary biomass production (cropping of biomass)	
c	Biomass collection, pre-treatment, transport and selling	
d	Biomass trade	
e	Biomass import	
f	Biomass conversion into energy (electricity & heat)	
g	Biomass conversion into energy (biofuels 1G)	
h	Biomass conversion into energy (biofuels 2G)	

i	Biomass conversion into energy (aviation fuels)	
j	Biomass conversion into bio-materials (e.g. bio products)	
k	Paper& pulp production	
l	Wood biomass processing for wood products (saw mills, plywood industry)	
m	Development of machinery for biomass handling	
n	Development of machinery for biomass conversion/pre-treatment	
o	Lobbying for higher sustainability considerations	
p	Representation of sector	
q	Research and consultancy in	
r	Policy development/implementation.....	
s	Certification of.....	
t	Other.....	

5. In what group would you categorize your company?

*(more than one option allowed; put **X** where relevant, and add text where needed)*

a	Biomass import	
b	Biomass end-use	
c	Biomass production	
d	Biomass export	
e	Biomass trade	
f	Research/consultancy	
g	Work in field of biomass certification	
h	Policy making.....	
i	Work for NGO in the field of	
j	Other (explain).....	

6. Please specify the activities of your company in relation to biomass.

***7.* What type of biomass does your company focus on?**

(more than one option allowed; put X where relevant, and add text where needed)

a	Sugar- , starch, and/or oil crops for 1G biofuels	
b	Woody and perennial biomass from dedicated crops	
c	Agricultural residues (e.g. straw, cuttings, oil palm residues)	
d	Forest biomass (round wood, pulpwood, chips and pellets from primary residues)	
e	Secondary residues from the forest industry	
f	Landscape care wood	
g	Landscape care grass cuttings (road side verges)	
h	Municipal Solid Waste	
i	Vegetal waste from households and industries	
j	Animal waste from industries	
k	Wood waste	
l	Used paper and cardboard	
m	Common sludge	
n	Other	

8. In which part(s) of the world does your company mostly operate?

9. In which part(s) of the world do you (in your current position) mostly work?

10. On which topics related to biomass do you need information for your work, and which are the most important?

(*put **X** and add text where relevant, and mark with number from 1-3 the top three most important)*

	Topics	**X**	**Top 3**
a	Biomass resources availability		
b	Biomass markets		
c	Biomass sustainability		
d	Biomass conversion technologies for electricity, heat, cooling		
e	Biomass conversion technologies for intermediates, liquid, solids, gaseous fuels		
f	Biomass conversion technologies for biochemical and biomaterials		
g	Biomass policies		
h	Biomass certification		
i	LCAs for biomass delivery chains		
j	Other, please add….....		

*NB from this point on, the questions concern in the first place the **interviewee** and **not the company** in general.*

11. Please indicate which information to be provided by a tool would be useful to you, and please point out the top 3 by importance to you.

(*put **X** and add text where relevant, and mark with number from 1-3 the top three most important):*

	Information on:	**X**	**Top 3**
a	Detailed spatially explicit cost-supply on biomass sources		
b	Sustainability risks per biomass type		
c	Details of the sustainability schemes in place, the criteria covered in the schemes and the biomass trade flows covered by a scheme		
d	Overview of the regulatory framework implemented in and outside the EU affecting biomass imports into the EU		
e	Current and future international trade patterns and market segments of biomass resources and competing uses for non-energy applications and for local uses		
f	Key characteristics of the traded biomass particularly in relation to suitability for different conversion/pre-treatment pathways		
g	Support for matching cost-supply of biomass to price-demand patterns		
h	Other, please describe.....		

12. Which geographic areas are you mostly interested in?

13. How often do you require this type of information?
*(put **X** or text where relevant)*

	Frequency	X and/or text
a	daily	
b	weekly	
c	monthly	
d	yearly	
e	Other	.....

14. What is the time-frame this information should be provided for?
(e.g. current situation, situation in 5-10 year or 10-20 years from now)

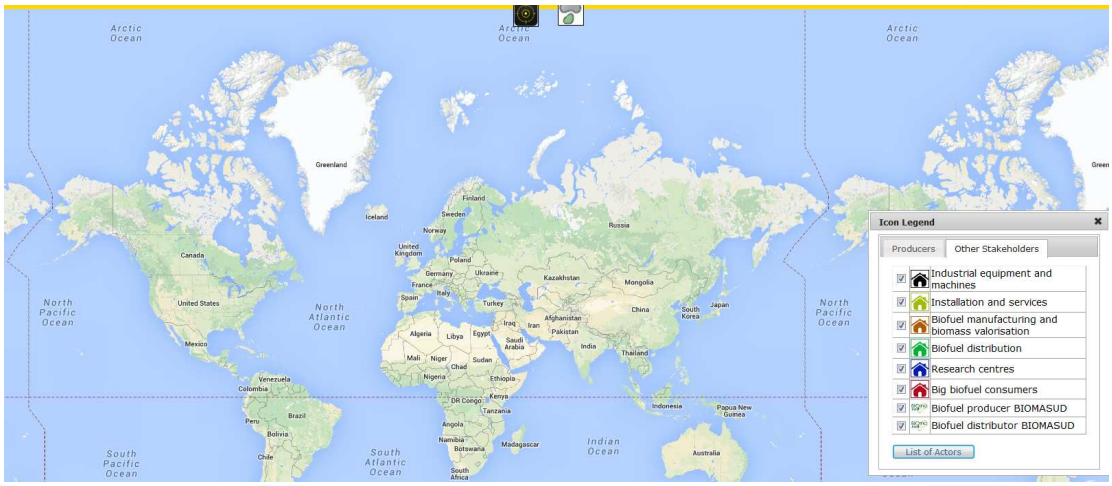
15. What are the main sources you collect this information from currently? (add more detailed information on type, source, availability)

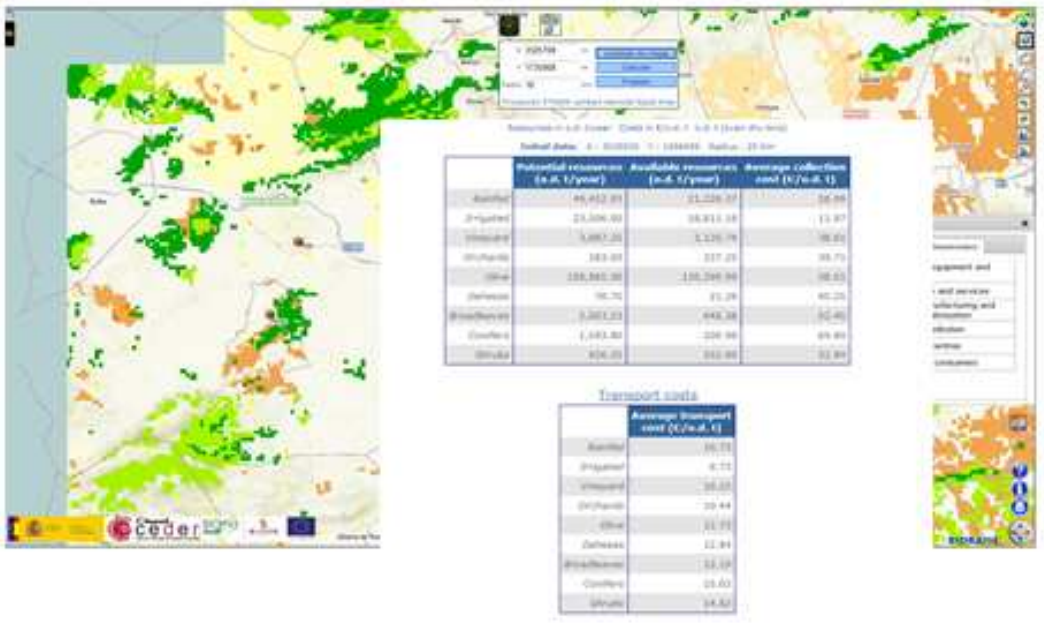
16. What (type of) information that is relevant to you is not available or is difficult to find? Please explain.

17. Are you already using specific internet sites or internet tools for collecting relevant information on biomass at this moment? If so, what tools do you use? Please explain.

18. Are you perhaps familiar with the "BIORAISE" tool, and have you ever used it? If yes, please explain your experience with it (by mentioning pros and cons of the tool and if you find it an attractive and useful tool and why). If no, please explain your first impression and whether you think such a tool would be useful to you.

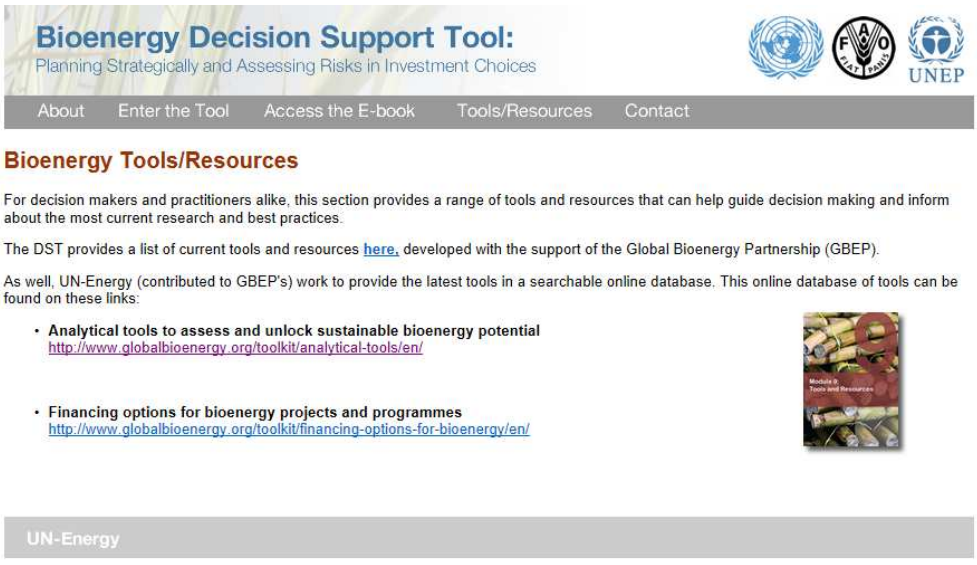
BIORAISE tool provides a calculation of biomass resource availability (agricultural and forestry primary, secondary and tertiary resources) for Spain, Portugal, France, Italy and Greece. http://bioraise.ciemat.es/bioraise/intro.aspx
Here are screen-shots of the BIORAISE tool:


Arctic Ocean
North Pacific Ocean
North Atlantic Ocean
South Pacific Ocean
South Atlantic Ocean
Indian Ocean
Icon Legend
Producers
Other Stakeholders
Industrial equipment and machines
Installation and services
Biofuel manufacturing and biomass valorisation
Biofuel distribution
Research centres
Big biofuel consumers
Biofuel producer BIOMASUD
Biofuel distributor BIOMASUD
List of Actors


Transport costs

19. Are you perhaps familiar with the 'Bioenergy Decision Support Tool', and have you ever used it? If yes, please explain your experience with it (by mentioning pros and cons of the tool and if you find it an attractive and useful tool and why). If no, please explain your first impression and whether you think such a tool would be useful to you.

The Bioenergy Decision Support Tool provides stepwise guidance to decision makers in governments to develop sustainable bioenergy policies and strategies, and to assess investment proposals. It was created as a website that allows users use the tool interactively. After an entry page providing on introduction to key issues. http://www.bioenergydecisiontool.org/



20. Finally, what should an internet tool deliver, to be useful to you? Please, explain.

Closing questions of the interview

21. Can we ask for more information if necessary for the processing of the answers later? *(put X where relevant)*

Yes	
No	

22. Would you like to be informed of the outcomes of this survey and the project in general? *(put X where relevant)*

Yes	
No	

23. If one of the above two answered with yes, then please provide your business card or/and your contact (email address and phone number)

Thank you very much for your help and participation in this survey/interview.

Appendix 2 Tables with interview results

Ranking	Category of company	Responses (interviewee number)	Total
1	Research/consultancy	2, 5, 7, 9, 10, 11, 12, 14, 15, 16, 18, 20, 22, 24, 28, 32, 33, 35, 36, 38, 40, 41, 42, 43, 46, 48, 49	27
2	Other (explain)	1, 8, 9, 12, 13, 17, 21, 24, 25, 26, 27, 31, 32, 37, 47	15
3	Biomass production	3, 4, 6, 11, 14, 26, 27, 30, 34, 38, 40, 45	12
4	Biomass end-use	3, 19, 21, 29, 30, 32, 39	7
5	Policy making	10, 16, 22, 23, 30, 50	6
6	Work in field of biomass certification	5, 32, 38	3
	Biomass import	19	1
	Biomass export	34	1
	Biomass trade	44	1
	Work for NGO in the field of ..	13	1

Table 1. The type of company/organisation at which the interviewees were employed

Ranking	Core business of company	Responses (interviewee number)	Total
1	Research and consultancy in *(different topics)*	2, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 22, 24, 28, 32, 33, 35, 36, 38, 40, 41, 42, 43, 46, 48, 49	28
2	Other	3, 4, 8, 9, 12, 13, 19, 25, 26, 31, 32, 47, 50	13
3	Biomass conversion into energy (electricity & heat)	10, 15, 17, 21, 27, 28, 29, 32, 36, 39	10
4	Policy development/implementation	10, 16, 22, 23, 30, 33, 37, 50	8
5	Primary biomass production (cropping of biomass)	10, 11, 14, 27, 38	5
5	Biomass conversion into energy (biofuels 1G)	10, 15, 21, 27, 28	5
5	Biomass conversion into energy (biofuels 2G)	1, 10, 21, 28, 36	5
5	Development of machinery for biomass conversion/pre-treatment	1, 11, 28, 43, 49	5
	Lobbying for higher sustainability considerations	13, 27, 32, 38	4
	Biomass collection, pre-treatment, transport and selling	11, 32, 34	3
	Biomass conversion into bio-materials (e.g. bio products)	19, 21, 28	3
	Development of machinery for biomass handling	6, 29, 43	3
	Certification of ….	5, 27, 32	3
	Primary biomass production and harvesting (forest industry)	10, 14	2
	Biomass conversion into energy (aviation fuels)	21, 29	2
	Representation of sector	13, 32	2
	Biomass trade	44	1
	Biomass import		
	Paper& pulp production		
	Wood biomass processing for wood products (saw mills, plywood industry)		

Table 2. The core business of the company/organisation at which the interviewees are employed

Ranking	Biomass type relevant	Responses (interviewee number)	Total
1	Agricultural residues (e.g. straw, cuttings, oil palm residues)	1, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 21, 23, 27, 28, 29, 31, 34, 36, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 50,	32
2	Woody and perennial biomass from dedicated crops	4, 5, 6, 7, 9, 11, 12, 13, 28, 29, 30, 31, 36, 41, 43, 44, 46, 47, 49, 50,	20
2	Forest biomass (round wood, pulpwood, chips and pellets from primary residues)	1, 5, 6, 9, 10, 12, 13, 15, 17, 19, 24, 28, 29, 36, 39, 41, 43, 47, 48, 50,	20
4	Secondary residues from the forest industry	1, 4, 5, 7, 9, 10, 11, 12, 24, 28, 29, 36, 43, 47, 48, 50,	16
4	Municipal Solid Waste	1, 3, 5, 8, 9, 10, 13, 15, 28, 29, 31, 36, 39, 43, 44, 48,	16
6	Wood waste	3, 5, 9, 15, 28, 29, 36, 41, 43, 44, 46, 47, 48,	13
7	Animal waste from industries	5, 8, 10, 12, 13, 21, 28, 38, 39, 41, 43, 44,	12
8	Vegetal waste from households and industries	5, 8, 9, 13, 15, 23, 28, 39, 43, 47,	10
8	Common sludge	3, 5, 8, 9, 10, 13, 23, 28, 39, 46,	10
	Sugar- , starch, and/or oil crops for 1G biofuels	5, 13, 19, 27, 30, 38, 46, 50,	8
	Landscape care wood	1, 4, 5, 11, 28, 43, 47,	7
	Landscape care grass cuttings (road side verges)	1, 5, 11, 28, 43, 47, 48,	7
	Used paper and cardboard	3, 5, 10, 28, 36, 39,	6
	Other	3, 4, 26, 28, 35, 43,	6
	All biomass types	14, 22, 25, 32, 37	5
	Algae	2, 7, 39,	3
	All biomass for energy	33	1

Table 3 The biomass types relevant for the interviewees

Ranking	Topics on which information is needed	Selected as most important by interviewee	Total (of 48)
1	Biomass resources availability	3, 9, 10, 14, 15, 20, 21, 22, 24, 26, 29, 39, 43, 45, 47, 48 ,49	17
2	Biomass conversion technologies for electricity, heat, cooling	4, 6, 12, 23, 31, 32, 40, 41, 42, 44	10
3	Biomass conversion technologies for intermediates, liquid, solids, gaseous fuels	2, 18, 28, 35, 36, 46	6
4	Biomass markets	5 11, 34	3
4	Biomass sustainability	1, 16, 30	3
4	Biomass conversion technologies for biochemical and biomaterials	13, 19, 38	3
4	Biomass policies	17, 25, 33	3
8	Other, please add…	8, 50	2
9	LCAs for biomass delivery chains	37	1
	Biomass certification		

Table 4. Topics on which interviewees need information

Ranking	Topics on which information is needed	Selected as number 1, 2 or 3	Number of answers
1	Biomass resources availability	3, 5, 7, 9, 10, 14, 15, 18, 20, 21, 22, 24, 25, 26, 27, 29, 30, 31, 33, 34, 35, 39, 41, 42, 43, 44, 46, 47, 48, 49, 50	31
2	Biomass conversion technologies for electricity, heat, cooling	2,3, 7,4, 6, 12, 13, 15, 18, 23, 25, 29, 31, 32, 33, 35, 36, 40, 41, 42, 44, 50	22
3	Biomass policies	1,3,4, 7, 8, 9, 10, 14, 15, 16, 17, 22, 24, 27, 29, 31, 32, 40, 43, 48, 50	21
4	Biomass sustainability	1, 7, 10, 14, 15, 16, 22, 27, 28, 30, 31, 33, 37, 38, 39, 41, 43, 46, 47, 50	20
5	Biomass markets	3, 5, 7, 9, 11, 13, 21, 22, 24, 25, 30, 31, 36, 38, 39, 41, 43, 47, 50	19
5	Biomass conversion technologies for intermediates, liquid, solids, gaseous fuels	4, 7, 11, 18, 22, 23, 24, 25, 27, 28, 30, 31, 32, 35, 36, 42, 44, 46, 50	19
7	Biomass conversion technologies for biochemical and biomaterials	7, 11, 12, 13, 19, 20, 22, 23, 25, 26, 28, 30, 33, 36, 37, 38, 48, 50	18
8	Biomass certification	1, 5, 16, 17, 22, 25, 27, 31, 32, 34, 47	11
8	LCAs for biomass delivery chains	2, 7, 15, 22, 27, 28, 31, 33, 34, 37, 47	11
10	Other	2, 8, 17, 19, 22, 40, 50	7

Table 5. Topics on which interviewees require information. A top 3 was asked, but some participants selected more than three options, others fewer.

Ranking	A tool should provide information on:	Selected as most important by interviewee	Total (of 49)
1	Detailed spatially explicit cost-supply on biomass sources	10, 11, 12, 15, 19, 21, 24, 28, 29, 31, 35, 39, 43, 47, 49, 50	16
2	Current and future international trade patterns and market segments of biomass resources and competing uses for non-energy applications and for local uses	2, 6, 13, 20, 23, 36, 38, 41, 42, 45	10
3	Sustainability risks per biomass type	14, 16 ,30, 33, 40, 48	6
3	Other, please describe	1, 3, 4, 8, 9, 17	6
5	Key characteristics of the traded biomass particularly in relation to suitability for different conversion/pre-treatment pathways	25 ,26, 32, 44,	4
6	Support for matching cost-supply of biomass to price-demand patterns	18, 37, 46	3
7	Details of the sustainability schemes in place, the criteria covered in the schemes and the biomass trade flows covered by a scheme	7, 22	2
7	Overview of the regulatory framework implemented in and outside the EU affecting biomass imports into the EU	5, 34	2

Table 6. The information a tool should provide to be useful to the interviewees.

Ranking	A tool should provide information on:	Selected as number 1, 2 or 3	Number of answers
1	Detailed spatially explicit cost-supply on biomass sources	1, 10, 11, 12, 13, 15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 28, 29, 31, 32, 35, 36, 37, 38, 39, 42, 43, 46, 47, 48, 49, 50	31
2	Support for matching cost-supply of biomass to price-demand patterns	3, 11, 12, 13, 18, 19, 21, 27, 28, 29, 31, 32, 34, 36, 37, 39, 40, 41, 44, 46, 48, 50	22
3	Current and future international trade patterns and market segments of biomass resources and competing uses for non-energy applications and for local uses	2, 3, 5, 6, 10, 13, 20, 22, 23, 27, 28, 29, 30, 35, 37, 38, 41, 42, 43, 44, 50	21
4	Key characteristics of the traded biomass particularly in relation to suitability for different conversion/pre-treatment pathways	1, 3, 4, 11, 14, 15, 21, 24, 25, 26, 27, 28, 30, 32, 34, 35, 36, 40, 43, 44	20
5	Details of the sustainability schemes in place, the criteria covered in the schemes and the biomass trade flows covered by a scheme	4, 5, 7, 10, 12, 14, 16, 19, 22, 30, 31, 32, 33, 40, 41, 42, 47	17
6	Overview of the regulatory framework implemented in and outside the EU affecting biomass imports into the EU	4, 5, 11, 15, 16, 22, 24, 25, 26, 27, 29, 30, 32, 33, 34, 43	16
7	Sustainability risks per biomass type	14, 16, 18, 27, 28, 30, 31, 32, 33, 38, 40, 43, 47, 48	14
8	Other, please describe	1, 9, 17, 32, 36	5
9	New projects still in early planning phase	3, 4, 8	3

Table 7. Information categories interviewees think should be offered by a tool. A top 3 was asked, but some participants selected more than three options, others fewer.